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NAVAL STRIKE FIGHTERS: ISSUES AND CONCERNS

HEARING

BEFORE THE

SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

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NAVAL STRIKE FIGHTERS: ISSUES AND CONCERNS

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES,
Washington, DC, Thursday, February 4, 2016.

The subcommittee met, pursuant to call, at 10:05 a.m., in room 2118, Rayburn House Office Building, Hon. Michael R. Turner (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. MICHAEL R. TURNER, A REPRESENTATIVE FROM OHIO, CHAIRMAN, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Mr. TURNER. The hearing will come to order.

The subcommittee today meets to receive testimony on issues and concerns regarding the strike fighter fleets for the Department of the Navy [DON].

I would like to welcome our distinguished panel of witnesses: Lieutenant General Jon M. Davis, Deputy Commandant of the Marine Corps for Aviation; Rear Admiral Michael C. Manazir——

Admiral MANAZIR. Manazir.

Mr. TURNER [continuing]. Manazir—sorry, director of—Manazir, Director of the Air Force division for the U.S. Navy; and Rear Admiral Michael T. Moran, Program Executive Officer for Tactical Aircraft.

Thank you for your service and for your attendance today.

We are here today to talk about the Department's strike fighter programs, but I want to take a moment to pause and remember the tragedy of January 14th in Hawaii, when we lost 12 Marines and 2 CH–53Es. We must do everything in our power to ensure the readiness and safety of our young men and women in uniform.

At the outset, I would also like to note that the Department of Defense [DOD] will not release its fiscal year 2017 budget until Tuesday. Accordingly, I expect that our witnesses will not be able to discuss the details of the upcoming budget request.

However, the members do have questions about the budget, which are to be taken for the record. I would ask that our witnesses respond promptly after the budget is submitted to Congress.

We have several issues to cover today, but in my opening remarks I want to highlight two committee concerns: the Navy strike fighter shortfall and the issue of physiological episodes in the F/A–18 fleet.

In hearings last year for the fiscal year 2016 budget request, Admiral Greenert, then the Chief of Navy Operations, described a requirement to procure an additional 3 squadrons of F/A–18E/Fs, or about 35 aircraft. Additionally, the Marine Corps' unfunded re-

quirements list included six F–35B aircraft to replace six AV–8B aircraft destroyed at Bastion Airfield in Afghanistan when the enemy broke through Marine defenses in September 2012.

This committee and the Congress heard that call. For fiscal year 2016 the committee added 12 F/A–18E/F aircraft and 6 F–35B aircraft.

The National Defense Authorization Act [NDAA] signed into law in November of last year reflects those increases. The Consolidated Omnibus Appropriations Act for fiscal year 2016 included these authorized increases and added two more F–35C aircraft for the Navy.

We know that that helped to alleviate some of the Navy's strike fighter shortfall, and the fifth-generation fighter increases will improve the Navy's warfighting capabilities. We look forward to hearing more from our witnesses on how these increases helped and how much more we need to do.

Since 2009, the Department of the Navy has noticed a rise in hazard reports, known as HAZREPs, regarding the physiological episodes in the Navy's F/A–18 and EA–18G fleets. According to the Navy, physiological episodes occur when a pilot experiences a loss in performance related to insufficient oxygen, depressurization, or other factors present during the flight.

We have been informed that the Navy has organized a physiological episode team to investigate and determine the causes of these physiological episodes in aviators. As symptoms related to depressurization, tissue hypoxia, and contaminant intoxication overlap, discerning a root cause is a complex process.

We understand that determining the root cause, or causes, of physiological episodes in F/A–18 aircraft is a work in progress. We look forward to learning more today about the Navy—what the Navy is doing to address this and it is an important issue. Very many Members of Congress are very concerned about these issues.

Before we begin, I would like to turn to my good friend and colleague from Massachusetts, Ms. Niki Tsongas, for any comments that she may want to make.

[The prepared statement of Mr. Turner can be found in the Appendix on page 31.]

STATEMENT OF HON. NIKI TSONGAS, A REPRESENTATIVE FROM MASSACHUSETTS, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Ms. TSONGAS. Thank you, Mr. Chairman.

And thank you, to our witnesses. Welcome. It is good to have you before us.

We here in Congress have no greater responsibility than making sure that the men and women we send into harm's way are provided with the best and safest equipment available. Today's hearing on naval strike fighters is an example of the kind of oversight Congress must do to make sure that happens, and I thank the chairman for focusing on this important topic.

There are many issues to discuss today, including whether or not we have enough strike fighters, the state of their material readiness, and the potential need for funding adjustments once we see the President's budget request [PB] next week.

However, while the number of aircraft we have is an important issue, the performance and quality of those aircraft is just as important. As such, I would like to focus my concerns today on one particular topic highlighted in today's testimony and the hearing materials provided to members.

This issue is the troubled performance of the on-board oxygen generation system of the F–18 fleet. Specifically, I am concerned about the high rate of hypoxia, which is caused by a lack of oxygen, and other physiological events apparently being experienced by the crew members of F–18 aircraft over the past 5 years.

The members of this committee remember well the impact that on-board oxygen generation system failures had some years ago on the F–22 fleet, both in terms of the risk it posed to service members and to the impact it had on the grounding of the entire F–22 fleet. With this in mind, it caused me great concern to learn of the higher than expected rate of physiological events for F–18 pilots over the past several years, going back to at least 2010, according to the Navy.

While it must be pointed out that there has, thankfully, not yet been a confirmed loss of life or aircraft attributed to such events, the increasing rate at which these incidents are occurring and their potential for catastrophic incidents is not lost on any of us. To me, this boils down to keeping our naval aviators and naval flight officers safe.

Just as we place a high priority on body armor for our ground troops, making sure the oxygen system works as it should in a $15 million-a-plane fighter aircraft should be a top priority. While there are many important parts of a complex fighter aircraft, I am sure our witnesses would agree that the basic life support system for the crew is one of the most important of all.

So I look forward to hearing more today about this issue as well as others that you are here to talk about, what the Navy is doing to correct it, and what the outlook for the future is. In addition, I hope to hear what Congress might be able to do to help solve the problem.

Thank you, Mr. Chairman. I yield back.

Mr. TURNER. Thank you.

I understand that only General Davis will be giving us an opening statement.

General Davis.

STATEMENT OF LTGEN JON M. DAVIS, USMC, DEPUTY COMMANDANT OF THE MARINE CORPS FOR AVIATION (DC(A)), U.S. MARINE CORPS; RADM MICHAEL C. MANAZIR, USN, DIRECTOR, AIR WARFARE DIVISION (N98), U.S. NAVY; AND RADM MICHAEL T. MORAN, USN, PROGRAM EXECUTIVE OFFICER TACTICAL AIRCRAFT, U.S. NAVY

General DAVIS. Mr. Chairman, Congresswoman Tsongas, distinguished members of the subcommittee, thank you for the opportunity to appear before you today to discuss the issues and concerns associated with the Department's strike fighter programs. Additionally, today we will be addressing fiscal year 2016.

The programs of the 2017 Presidential budget submission has not been released, so we won't be talking about that today, sir.

Joining me today is the Navy's Director of Air Warfare, Rear Admiral Mike Manazir; and the Program Executive Officer for Tactical Aircraft, Rear Admiral Mike Moran. I am honored to be here with them today.

As you are well aware, the Department faces an aviation readiness challenge, which includes reduced strike fighter capacity available to support the tactical aviation force's operational and training requirements. While your invitation requested focus on these DON strike fighter challenges, we note the readiness of—is a preeminent concern for all of naval aviation, and that extends beyond the strike fighter inventory alone.

The Department's legacy F–18 and AV–8B readiness challenge is attributed to a series of events beginning with the delays in JSF [Joint Strike Fighter] procurement, which translated to an unplanned maintenance to extend the service lives of legacy aircraft beyond their designed life. Additionally, combatant commander-driven operations and Navy and Marine Corps training and readiness requirements are driving increased strike fighter utilization rate, thereby adding to the current depot maintenance workload.

In an effort to meet strike fighter inventory requirements, our depots are executing a service life extension program. However, the depots' throughput of planned service life extension work has been complicated by the discovery of unexpected corrosion-induced work, leading to longer repair times for the inducted airframes. The extremely high demand for our assets for such a prolonged period of time is challenging our ability to maintain and sustain them appropriately.

While the Navy and Marine Corps share the Department's F–18 A through D fleet, the resulting readiness challenges associated with increasing F–18 at or reporting is vastly different. The Navy prioritizes and continues to meet deployed readiness requirements set forth in the Optimized Fleet Response Plan.

Achieving these standards, however, has come at the expense of force training for the operational squadrons at the early stages of the fleet readiness training plan and the fleet replacement squadrons responsible for the air crews' initial and refresher training—basically training our seed corn. This poses risk to our future readiness, impacts our surge capacity, and places additional stress on the operational hardware through overutilization.

As the Nation's force in readiness, the Marine Corps does not achieve readiness requirements on a tiered structure. Rather, Marine aviation is expected to sustain a nominal readiness requirement to fight tonight.

However, Marine aviation is not meeting that readiness requirement, due in large part to the limitations in operational capacity—not enough airplanes on the line.

In the strike fighter communities we are unable to generate the minimum flight time required to operate the thresholds to readiness—required readiness. The challenge is twofold.

In our F–18 A to D fleet we are simply not producing enough aircraft at our depots to meet our readiness requirements. In our Harrier fleet, the primary limiting factor is parts availability—supply.

Together, these challenges manifested in an overall force readiness degradation that can only be overcome with improved equip-

ment availability through legacies in sustainment and in new aircraft transitions. We are addressing the problems through an—on a number fronts, including initiatives to improve our depot throughput to return more aircraft to fleet—and you will hear more about that today, I am sure; synchronizing our readiness enabler accounts; and exploring means to reduce utilization.

The sustainment of our legacy fleet is a priority to meet our combatant commander-driven operations in the near term. We have also recognized the adverse effect overutilization has on our hardware and on our—and have implemented service life management protocols into the F–18 E and F fleet earlier in its life cycle.

Finally, we are successfully integrating new F–18 and F–35 aircraft into the fleet to address the usage attrition, a portion of our challenge that can only be overcome through aircraft procurement.

We thank Congress for recognizing our concerns in fiscal year 2016 and helping like you did—that, in fact, is going to be really, really helpful—and authorizing and approving—appropriating additional funding for aviation depot production and the additional strike fighter aircraft to address our military capacity challenge.

We appreciate the committee's continuing support and oversight on these important issues and look forward to the questions as we explore all facets of this complex situation.

Thank you. I look forward to your questions.

[The joint prepared statement of General Davis, Admiral Manazir, and Admiral Moran can be found in the Appendix on page 33.]

Mr. TURNER. Thank you, General.

In your prepared testimony, General Davis, you note that naval aviation readiness is in a precarious position and that Marines are flying an average 58 percent of the required flight time necessary to be ready for the Nation's call. Can you talk about the factors that have led to this decreased state of readiness?

And also, Admiral Manazir, can you please tell us—you state that the Navy is also in a precarious position—are they getting as few as 58 percent of required flying hours, like the Marine Corps?

And this would be a great opportunity for both of you to give a commercial on why this budget year is incredibly important, because that is what we are doing right now.

General DAVIS. Absolutely, sir.

I can start if you would like, Mike.

Admiral MANAZIR. Go ahead.

General DAVIS. We are. I ran the numbers. Again, I get almost a weekly update on where we are, and we tracked a 30–60–90 flight time for our pilots.

So if you look at the inventory in our flight lines, it is really a readiness factory. And our training and readiness manual for the Marine Corps, we are not on a tiered readiness profile; we operate what they call T2.0, which means about 70 percent of our fleet is ready to go, and go meet our Nation's bidding.

We have got a reduced or smaller number of squadrons that meet our operational commitments, but—so we don't do a tiered readiness. We stay at a—our target is to stay at a constant level of readiness.

The training and readiness manual for an F–18 pilot calls for about 15.8 to 16 hours a month per pilot to fly. They are flying, on average the last 365 days, 10.6 hours a month, so significantly lower than the requirement.

The Harrier fleet is supposed to fly about 15.4 hours a month. They are flying about 10.3 to 10.4 hours per month, so vastly lower than the requirement.

So they are not achieving a T2.0 readiness level; they are achieving about a T2.7 level.

We are meeting our operational requirements, and what we are doing is we are paying with that middle bench. Those forces that would deploy quickly when the Nation called for a contingency, they are getting less airplanes to train with. While we are meeting our operational commitments, we are doing that just in time.

I would say that is a result of a couple things: One, reduced budgets for operation and maintenance accounts; delay of the new aircraft procurement, or lowered ramp for airplay of the Marine Corps' case, like the F–35. The sequestration impacted us, and also I think sequestration really impacted on the depot capability out there to repair our aircraft.

So in the Marine Corps on the TACAIR [tactical air] side—that is F–18—today the F–18 fleet is operating right around 50 percent of its capacity in the United States Marine Corps.

If I was to add the F–18s and the Harriers that I am supposed to have on the line on any given day, it is about 238 airplanes. Of those 238 I am supposed to have on the line to meet that T2.0 readiness requirement, about 178 are what they call "in reporting," that they are there, they are actually on the flight line, okay?

Of those 178 I can fly, today, this morning we could get airborne about 110 of those airplanes. There are just not enough up airplanes on the line, sir, all right?

So it is a combination of how we sustain our aircraft; in the Harriers' case, not enough parts for the Harriers. We have done an independent registry review to figure a way to basically get out of that, and I briefed the committee on that.

And last year your help in 2016, laying supplies and money in to go help us recover that platform will help us recover the Harrier in about 2016–2017 back to where we need to be on our flight line readiness.

The F–18 is more of a depot problem, and it is a little bit longer problem. But talking with Admiral Manazir and working very closely with the Navy, we believe we will be back to 12 aircraft per squadron somewhere about FY [fiscal year] 2017 or early 2018.

A shout out, from my part, to Admiral Paul Grosklags and Admiral L.J. Sewell. I think that they are doing a great job down there with the resources we have given them to change both the readiness equation in NAVAIR [Naval Air Systems Command] and what they are doing in our depots.

So bottom line, I would say that we don't have enough assets on the line to do the job, enough up aircraft to train our Marines. We will make our Nation's call and readiness, but I think there is risk out there in the larger fight with our bench not having enough aircraft to train and fly with on a daily basis.

Admiral MANAZIR. Mr. Chairman, thank you for the question.

We have similar readiness statistics as the Marine Corps in the percentages. As General Davis noted, the Marine Corps does not tier their readiness; they stay at a level readiness to be a force in readiness all the time, 24/365.

The Navy has a tiered readiness system, where basically in the early phases of the workups prior to going on deployment we have a lesser readiness requirement, just as the squadrons get ready to go in the basic training phase. And then we move to an intermediate phase where we resource them a little bit higher. And then we fully resource them to go on deployment.

We also are meeting our deployed requirements. We are meeting our integrated and advanced training prior to deployment. Where we are taking the readiness hit is down in the lower maintenance phase or basic phase, when you want to just get an aviator time to fly.

We have found that even in this tiered readiness level, if you picture sort of a bell curve in training, so you train up, you go on deployment at the highest level, and then you walk back down again, that bell curve has gotten steeper. So we have taken the readiness out of the front end and the back end, where you sustain the readiness.

That means that a significant part of our force that is shore-based, in training and not deployed yet, is experiencing a lot less flight time than they are required to spend. And so it gets to the same kind of percentage chances that General Davis talked about.

We have had to shut down squadrons if they don't have enough time in the air. We create a floor of flying hours at 11 hours a month—we call that our tactical hard deck—for a pilot in the United States Navy, and we say, "If you can't get 11 hours per month you are not proficient and current enough to remain safe in the airplane." And so we try to get that 11 hours per month.

The proximate causes of this are the underfunding of what we call the enabler accounts. Your committee, Congress has been wonderful in PB16 of giving us the readiness funding and the increases in aircraft to help with the problem.

But we have had about a decade of critical underfunding of what we call the enabler accounts. So if the flying hour count is the 1A1A account, that is the money it takes to fly the airplane, the hours that it takes. Underpinning that 1A1A account is the depot account, 1A5A; sustainment accounts like the 1A3A and the 1A4N. I am doing alphabet soup here.

The problem is that we typically focus on one kind of account. We go fly the hours and we underfund the spares; we underfund the depot; we underfund the parts that go into that flying.

And we have done that in the service over the last 10 years, and that stuff is coming to fruition.

Sequestration hit us, as General Davis said, where the workforce in the aviation depot was laid off. We couldn't bring that work to bear on the depot workload, and those depot airplanes backed up. So it is a combination of factors.

Again, the PB16 budget moves the needle in the right direction. The aircraft that you added—and as you noted in your statement, Mr. Chairman, Admiral Jon Greenert last year said, "I need two

to three squadrons to fix the hole that I have to replace the airplanes we have been using over the years."

So far we haven't got the two to three squadrons yet, although we are moving towards that, thank you very much. And so we still need about another 16 or so Super Hornets to fill the hole here in the midyears of the teens.

But we are experiencing the same kind of readiness hits that General Davis is and we are having to take those hits back at home and so keep the deployed operations moving.

Mr. TURNER. General Davis, the Marine Corps has the majority of the Navy's legacy fleet of F/A–18s in its inventory, which are affected by the problems with the environmental control system, causing physiological episodes in aviators. General, I was a mayor before I came to Congress, and of course I had police force and a fire department.

Our fire department had problems with their breathing apparatus, and they—we never could figure out what was wrong with it. It would randomly go out when people were in, you know, the most unsafe conditions, obviously, running into burning buildings to save other people.

In the end, even though we couldn't find what the problem was, we had an issue of confidence with our firefighters, and it affected their performance and their safety. How is this affecting the issue of the confidence of our pilots?

General DAVIS. I think that, first off—and I have flown both the AV–8 and an F–18, so one of the things I learned flying the F–18—I am very confident in the OBOGS [On-Board Oxygen Generation Systems] system in the AV–8 but, you know, I was—we always watched the—on the climb-out the schedule to make sure that we are good to go from an oxygen perspective.

I will tell you that I am very confident my Navy team here to go fix the OBOGS problem, make sure we got a—I got a good system for my Marines. The Marines love flying the F–18. It is a workhorse for us.

We don't worry that much about the OBOGS right now, and again, we do have—we know that the Navy is working that for us, so—and I actually have—my youngest son is a Marine F–18 pilot that flies an OBOGS F–18C right now and just got back from deployment. I think he is more worried about his—the number of airplanes on the line right now for him to go train than he is the OBOGS.

But I do defer to the Navy exactly what we are doing on that, sir, but that we are confident the Navy is getting their arms around the OBOGS problem.

Mr. TURNER. And the environmental control system?

General DAVIS. That as well, sir.

Mr. TURNER. Admiral Moran, sustainment of the F–35: Now that the F–35B has entered the Department of the Navy's inventory and its first operational squadron last year, and the Navy is expected to declare IOC [initial operational capacity] with its F–35C in the late 2018 or early 2019, what challenges do you see for sustainment of these aircraft and how is the Naval Air Systems Command preparing for these challenges?

Admiral MORAN. Thanks, Mr. Chairman.

First I will tell you that the F–35 is not in my portfolio, so the tactical aircraft for the Navy—F–18, AV–8B. F–35 is still run by the Joint Program Office [JPO], General Bogdan.

So I will tell you we are full participants in the JPO when we talk about sustainment, integration to the carrier deck and how we work those issues. But I would not comment here today on the long-term sustainment of F–35 in the Navy. I would really defer that to the Joint Program Office or the F–35 Program Office.

Admiral Manazir.

Mr. TURNER. Would you like to comment on the physiological episodes in the F/A–18, please?

Admiral MORAN. Oh, absolutely. Yes, sir.

You know, ma'am, you mentioned this is a top priority. I will tell you, it is absolutely a top priority in the United States Navy and the Marine Corps. You know, we have what we call the Naval Aviation Enterprise, that we meet monthly at the three-star level.

So General Davis, Admiral Manazir are leaders on that team. Admiral Shoemaker, who is the commander of Naval Air Forces, leads that with Vice Admiral Grosklags at NAVAIR Systems Command.

And so that is a top priority that is discussed on a monthly basis at the three-star level. So every incident that occurs, I will tell you, comes to my desk if not daily, certainly weekly.

And we have a very robust physical episode team, as you mentioned, and pretty much over 120 people at this point that are looking at every aspect of our environmental control system [ECS], of our OBOGS system, and really the human interface to that system to make sure we are uncovering anything that can continue to mitigate that risk.

I will tell you, since 2009, when they started raising or increasing in numbers, we put a lot of things in place. The ECS system really is a decompression sickness piece, so it is a pressurization in the airplane.

So we have made probably close to 18 or 19 changes in that system to date—pressure valves, control valves, sensors—as we have updated that airplane and we learn more. So continuously looking, from a material standpoint piece.

On the OBOGS side, we are looking at replacing some of those components, too.

Sir, and your mention on the breathing apparatus for the firemen, it is the same thing. So, you know, when we get the gas—or the air through the engines and we filter it to get the nitrogen out and then other contaminants out, it is really a filtration system that we are looking at.

So we replaced that filtration system. We field it in about 219 jets today; we are going to get it in all the jets. That really has done a great job of getting rid of the carbon monoxide and improving the breathing gas for the pilots.

And then the oxygen monitor system, we have got a new system in place now that has been in test—funded in 2017 to start going on the airplanes when it completes tests here later this year. So incrementally, each of those systems replacing that.

But I will also tell you, from leadership's direction, the awareness of the problem is just been made keenly aware across all of

our sites. So we have a roadshow that is the NAVAIR System Command engineers, our fleet folks, our safety center folks, our aviation medicine folks, go out to all of the sites and really increase the awareness for our pilots of what the—what it—what we are dealing with.

So we have increased the training as part of that. So what we did every 4 years to do hypoxia training we are now doing every year. We have got a new, more realistic breathing apparatus training environment that we do every 2 years now that really gives the pilots a real kind of sense of what that hypoxia feeling is going to be, because it is really that awareness piece.

And then the training and air crew procedures, all being implemented. So what I would tell you what we do now and I can see that on a daily basis.

When an incident pops, you know, I would tell you, before the pilots would go on their oxygen, their auxiliary oxygen for 100 percent for a period of time and then get out of it. The new procedure is, hey, bleed that system out, recover the airplane, and return to base.

And I will tell you, that is—in every incident that I have seen in my time here so far the pilots are executing those new emergency procedures very effectively.

So I think where it is a multipronged approach that we are hitting this. It is absolutely a focus for us and we continue to make gains.

And I will tell you that the things we are doing now is really trying to understand the contamination piece. I mean, are there any things getting in the gas, you know, that the pilots are breathing that we are not aware of?

So I think we have really gone after the carbon monoxide and have really good test results. And now we are doing a study to see what else is out there that may be contaminating, you know, the gas that the pilots are breathing.

Right now we don't have a way to measure that in the airplane, and so we are looking at ways right now, testing a couple things down at Pax River that we can put into their emergency gear to not interfere, but measure the gas so that if there is something out there that we are not seeing yet, hopefully we will learn that and build that into the filtration system.

Mr. TURNER. Thank you, Admiral.

Congresswoman Tsongas.

Ms. TSONGAS. Thank you, Mr. Chairman.

And I appreciate, Admiral Moran, your testimony in trying to address some of the issues. But I do want to continue to have a conversation around it because it is, I think, an issue that despite all your efforts and investments in policies and training and everything else, the numbers still don't go down.

I mean, in fact, they have, I think over the last—the rate of events has been consistently in the range of 20 to 30 events per 100,000 flying hours for the past 3 years. So even as you have made these investments, you are not seeing a lot of progress.

So, Admiral Manazir, I wanted to ask, what would be a normal or expected rate of such events for the fleet? And what would you

look to see as these efforts are being made? Is there such a rate? Have you created something that you are looking to achieve?

Admiral MANAZIR. Ma'am, that is a good question. Let me describe the physiological event just a little bit and put it into terms that might be a little more understandable.

First and foremost, I have complete confidence in the system—the training and the backup systems that we have on the Hornet and the Super Hornet. We designed them for redundancy.

A physiological event occurs when a pilot feels dizzy, feels confused, feels a little strange in the airplane. Admiral Moran mentioned the trainer that we have now.

I have been flying Navy airplanes since 1982 on oxygen. I commanded an F–14 squadron that had OBOGS back in 1998. I have two cruises with that system and I have four cruises with the Super Hornet—deployed Super Hornet.

I have never experienced a hypoxic event outside of training. I haven't personally.

But what we do with the trainer now is you get into a simulated cockpit on the ground, you put an oxygen mask on, and you do simulated training. The system is set up so you can fly a simulator. And they gradually reduce your oxygen content and they train us to recognize the symptoms.

It is not a instant "you are gone." It is a confusion factor.

And so when a pilot feels that, he is—he deploys his emergency oxygen, which is 100 percent oxygen bottle like we used to do. Then he reaches down underneath his left thigh, he pulls a handle, and he goes onto emergency oxygen.

That backup system immediately gives him emergency oxygen and the symptoms subside enough for him to land the airplane. That system has worked 100 percent every time and I am confident it still will.

We haven't developed a rate per 100,000 flying hours because even one event like that, catastrophic, can—you can lose the airplane. I don't think we will, but we are trying to drive these events down through all of the actions that Rear Admiral Moran talked about, and driving those rates down.

I will comment to you that the rates started to climb in 2010. That is the year that we told everybody, "Okay, we think there is a problem here at Navy leadership."

So instead of just coming back and going, "Yes, I was kind of dizzy. Everything is fine. It passed. It passed," we said I want you to report every single event. So I think the phenomenon that you are seeing between 2010 and now is an increase in reporting.

They are very real events and they do key us into where we go for causal factors. But the chairman talked about the firefighting breathing apparatus. It is like chasing a ghost; we can't figure out because the monitoring devices that do this are not on the airplane to figure out whether there was a small oxygen content more than we needed, less than we needed, or a carbon monoxide event, or poison in the gas, something that came off of bearings, breathing toxic air.

We haven't been able to figure that out, so we have been chasing ghosts. I mean, we are replacing and creating new parts and chasing those things.

So, ma'am, I think we are just trying to get that rate down as far as possible, while still understanding causal factors. But if we had a confidence problem in the airplane we would ground the fleet.

And we don't have that problem. That is why you don't see the commander of Naval—NAVAIR, Vice Admiral Paul Grosklags, going to that extreme measure, because we have confidence in the system. We are just trying to figure out the cause of these episodes.

Ms. TSONGAS. And I appreciate the efforts that you all are making. It is obviously a real issue and one that—in which the safety of the pilots is, you know, paramount in everybody's mind.

But even as you are making all the—so I appreciate that the reporting is better so you have a better understanding of the scope of the problem. That is always the first step we have to take.

But that has also been in concert with all these other efforts that you are making to try to address and solve the problem and fix it. And despite that, there seems to be no progress made because the reported numbers remain the same.

So I am curious, in addition, as we are talking about the budget going forward, what the cost of this has been. And is it a funding issue? Is it a technological—some issue that people just somehow haven't been able to identify? Could you address that?

Admiral MORAN. Yes, ma'am.

You know, I don't see it as a funding issue. We have gotten all the resources we have asked for on the technical side to go ahead and investigate the causal factors, so I don't see it as a research question.

The new filter material that we are replacing in the current systems has been funded and supported, so we are putting those in the airplanes as we speak. Like I said, only 219 systems to date, but, you know, they are looking to do about 40 a month to get that into all the jets.

The new oxygen monitor system is resourced. It is going through the final stages of its testing, as I said, in Pax River. That is funded in fiscal year 2017 they have to be installed in the airplanes.

The changes we have made to date on the ECS system have all been funded and supported across the board.

So from an acquisition standpoint, providing systems to the fleet, I have not faced any resource challenges or issues to get that support across the enterprise.

Ms. TSONGAS. Have you looked at installing an automatic backup system, and would there be a cost to that?

Admiral MORAN. Well, as Admiral Manazir talked, we do have the automatic oxygen—the oxygen system as a backup. What we are looking at is can we increase the amount of that oxygen system that we carry in the airplane so we can give it a longer duration and that emergency piece. So we are actively today looking at can we increase.

Right now, depending on the altitude and really the condition of the pilot, that lasts anywhere between 20 minutes and maybe down to 5 minutes. So can we extend that, you know, by two- to fourfold to give that pilot a—you know, that real backup system for an extended period of time? We are looking at that, as well.

Ms. TSONGAS. Would there be a cost issue associated with that?

Admiral MORAN. It would be an expense, yes, ma'am.

Ms. TSONGAS. Thank you. I yield back, Mr. Chairman.

Mr. TURNER. Representative Cook.

Mr. COOK. Thank you, Mr. Chairman.

We talked a little bit about some of the concerns in aviation readiness, General, and I want to talk about the backlogs in the depots.

During the summer every year I kind of go back for a reunion at Camp Lejeune. I was in the Swansboro area.

By the way, every August it rains down there every time I come and it comes down in buckets, but that is another story. Things haven't changed much.

But I went out to Cherry Point and I visited the depot there, and I was very, very impressed with the briefs and everything like that. But I am concerned about the room that they are going to have; I am concerned about whether there is enough actual space there, and this is for not only the East Coast depot but the—and I haven't visited the West Coast depot—whether you have the physical space in the plant.

They did say there, you know, I started to ask them about space, do we have to acquire land or what have you. They said no, they already own the land, which is amazing, and they can do it.

So is this a concern about backups, about whether you are going to be able to take care of the F–35s? And do you have the readiness right now in the depots to handle this increase in terms of manpower, parts, and room?

General DAVIS. Yes. Congressman, thank you very much for that question. I will probably ask Admiral Moran to help me a little bit in the end of that.

But I would say we have got a pretty—we have got a good military construction plan to make sure that we have got the facilities to take care of our platforms—I do worry, it is not for this committee, but the V–22 as that comes into its rework.

Will we have the room to go work those airplanes in? We are working them really hard and we are putting a lot of hours on those airplanes. They are going to come into the depot.

As we work the depot, the number—probably one of the number one things we need out there besides—and every airplane is a little bit different, so they aren't working on F–18s up there; we are working on Harriers, CH–53s, V–22s. In that case here there is some corrosion, a little bit in the V–22, but mainly, our main limiting factor out there with that particular depot is spare parts.

You know, the parts—they would call, like if you are a racecar driver you are going to come in and get a complete turnover new parts you would have a list of equipment out there that you would put on that airplane. Same thing really with our F–18s, getting what they need as they come in, the—kind of the most common parts that come off that airplane need to get replaced.

That is the number one thing for us right now with both Harrier, CH–53, both in the depots and in the flight line, is basically getting our turnaround time to where it needs to be. The 53 deals with about 25 percent—cable supply, as does the Harrier.

And frankly, it is probably—you asked, Congressman Chair, you asked about the sustainment on F–35. That is my number one con-

cern with F–35 is underfunding its spares accounts, both for the depot and for the flight line's units.

Mr. COOK. General, I want to switch gears a little bit, F–35——

General DAVIS. Sir.

Mr. COOK [continuing]. And Expeditionary Air Field, Twentynine Palms. Years ago when the Harrier first came out used to have a sweeper to clear Lyman Road at Camp Lejeune.

General DAVIS. Right.

Mr. COOK. I used to always laugh when I saw that because of the fog and all that stuff.

General DAVIS. Right.

Mr. COOK. Is that going to be a problem or are we going to have to go away completely from an expeditionary air field?

General DAVIS. No.

Mr. COOK. Because when that wind blows at Twentynine Palms or in the desert or all that stuff there, this is a very, very expensive aircraft, and if you can reassure me and tell me everything is going to be fine.

General DAVIS. We just actually did a deployment up to Twentynine Palms——

Mr. COOK. I know——

General DAVIS. And bottom line is they—it was the typical—it was November, December wind patterns out there and it wasn't necessarily—they lost some sorties for weather mainly due to the crosswind limitations on—for the air—for affording that direct crosswind. And a lot of time above about 25, 30 knots you don't fly because if a pilot ejects out of an airplane they get pulled across the desert floor and get—could get hurt that way.

So Twentynine Palms is a training environment, so it is not operational. So we limit to the wind limits out there to make sure that we don't hurt somebody.

We actually dinged—on that particular deployment we actually had blade damage to two engines, right? But when we looked at it it wasn't blade damage that required the engine to be removed. So we do have that. In every jet aircraft out there little rocks, little things get pulled up.

But in this case here the F–35 proved to be very robust. It had some blade damage; it was blendered out and it wasn't a problem.

So what we are doing, though, in that—Major General Mike Rocco, a great commander down there at Miramar—they are very conservative and I think that is sensible. That airplane wasn't supposed to go to Twentynine Palms until this spring. We pushed it up there early because, one, we wanted to stress, you know, how that airplane would operate logistically, how it was going to operate in support of the grunts out there at Twentynine Palms. And frankly, that airplane belongs in every climate place—not just on a main base, but on an amphibious carrier and also, too, in our expeditionary bases.

So we got a lot of the data points we wanted to out of that. We will always have to be FOD [foreign object damage]-conscious when we go to expeditionary bases. But part of that is how we operate; part of that is what we have to sweep up to go in there.

Mr. COOK. Thank you very much. I yield back.

Mr. TURNER. Representative Johnson.

Mr. JOHNSON. Thank you, Mr. Chairman.

Admiral Manazir, over the past couple of years the Navy has cut F–35Cs in the future years defense planning budget. With the threat growing in numbers and capability in the 2025 timeframe and beyond, what is the Navy doing to recover these aircraft to ensure our carrier strike groups and carrier air wings remain relevant and are able to counter the growing threats?

Admiral MANAZIR. Thank you very much for your question, Mr. Johnson.

The Navy's procurement of F–35C aircraft were cut for fiscal reasons, in line with other Navy priorities.

And thank you, to the committee, for the support of extra F–35Cs in the PB16 budget, and that goes a long way towards capability.

You will find the Navy buying additional F–35Cs in greater numbers as we go forward. The Navy, operating off of our flight decks, operates integrated capability, whether Super Hornets, EA–18G Growlers, E–2D Hawkeyes, or helicopters, to create a capability that can overmatch the threat.

The F–35C is a critical part of that netted capability. Its stealth characteristics, its data fusion capability, and its very advanced identification of the threat capability allow us to extend the reach of the carrier strike group.

So I think you will find, sir, that as we push forward in these future budget cycles that our prioritization of the F–35C for warfighting capability will increase.

Mr. JOHNSON. Thank you.

General Davis.

General DAVIS. Again, adding the six Harriers last year—or the six F–35Bs to replace our combat losses is incredibly important and I want to say thank you very much, on behalf of the entire Marine Corps, for doing that. We lost a great squadron commander and six airplanes destroyed and two damaged at Bastion.

Those airplanes are now going to be—fill up a VMFA–122. By getting those airplanes it will allow us to move an F–18 squadron—an older F–18 squadron out and move the new airplane in.

I just spent the last 2 days down at Fort Worth with our F–35 pilots and took—General Neller went down there with us. I will tell you that we have a war-winning airplane.

So with the Marine Corps we heard Congressman Cook ask about going to expeditionary bases. We will go to our amphibious ships; we will go to expeditionary bases. And that airplane is going to change the way we fight.

We took all the senior Marine leaders on down to go watch this for 2 days, and we had the young guys that are flying the airplane. They are flying a completely different way than everything we have ever flown before in a very positive way. Real combat capability, real combat multiplier.

I think it is going to make the Marine Corps the force in readiness to be exponentially more qualified and more capable to meet the threats that loom at our Nation's bow. We have got exactly the right system out there.

Thank you for the support on that.

Bottom line, what I do worry about is that it comes in—not only the airplanes, and we are going into a full rate of production pretty close here in 18—is the sustainment support that goes along with that. If we get this great new airplane and my readiness rates are as good as they should be because I am taking parts off good airplanes because I don't have the parts out there to put them on another airplane, and to make the readiness goals I need to, I think that would be a real tragedy.

It is a fantastic airplane. With the young aviators that were out there, the only thing they can complain about with this airplane—the only thing—was spare parts. Not enough spare parts.

Thank you, sir.

Mr. JOHNSON. Thank you.

General Davis, the F–35 is the only fifth-generation aircraft in production today, and I would like for you to highlight for us what the F–35 fifth-generation capabilities bring to the fight.

General DAVIS. What we saw yesterday in a couple scenarios—and I want to—be careful—we have got to watch the classified nature of some of this stuff, the capabilities we have out there—we did close air support in a contested environment through overcast weather.

We took a division of airplanes and basically we had a division of F–35Bs launching off an amphibious carrier and it struck a target that would have taken—to do—to take the target—and I was the CO [commanding officer] of our weapons school MAWTS [Marine Aviation Weapons and Tactics Squadron] One. To do that strike with the conventional assets the Marine Corps owns today would have taken 12 to 14 airplanes. We did it with four.

We dealt with a very high-end sand threat. We dealt with weather doing close air support through the clouds. I am not sure we would have got in with the conventional fourth-generation airplanes we fly today. It would have been a very difficult problem.

With fifth-generation, four airplanes, and the way they flew those airplanes, looking at basically talking to the forward air controller through the clouds with their synthetic aperture radar, with picture-quality optics out there through the cloud, 1,000-foot overcast, we would not be able to do that today. But a high degree of fidelity.

I think it is going to change the way we do close air support, and change the way we support our Marines on the ground.

The second scenario was a four ship going against a very—a strike mission defended by very high-end surface-to-air missiles and a very high-end adversary aircraft—division of aircraft. They took care of all the four adversaries they were up against, took care of the sand threat, and killed the target with no attrition.

So I think it is going to change the way we do business. It has certainly changed the way that the Department of the Navy fights the fight because we will fight our F–35Bs alongside the carrier wing out there, being an integrated fight out there, I think getting better value for the taxpayers' money and much better capability than we have had today.

Like the V–22 has changed the Marine Corps and the naval services in a positive way how we project power from the sea, the F–35B is going to allow us to project power from a sea base and our

expeditionary bases ashore in a very positive way for our Nation. I was very excited what I saw yesterday not from what I know but really from what those young guys were doing in the airplane with the technology that you provided for them.

Thanks very much.

Mr. JOHNSON. Thank you.

And I yield back.

Mr. TURNER. General Davis, thank you for elaborating on the F–35 sustainment question with—on Admiral Moran's answer.

General—excuse me, Representative Graves.

Mr. GRAVES. Thank you, Mr. Chairman.

My question is for General Manazir, and it is encouraging to hear, obviously, the Navy has taken the, you know, the tactical aviation, at least the shortfall, very seriously, and you are obviously intending to acquire more F/A–18s. And you have testified before this committee before and you have said that the mainstay of the, you know, the strike fighter force is—F–18s is going to be through 2035, I think was the timeframe that was used. And we are now two or three squadrons short, given the shortfall.

But I would like you to address, you know, the importance of keeping the Super Hornet and the Growler lines operational, which is something that worries me, because you can't just start these lines up, you know, out of nowhere. And if we are going to keep these airplanes flying and maintained and everything else, we have to keep those, you know, those lines moving. But can you address that?

Admiral MANAZIR. Yes, sir. Thank you very much for the question.

As I testified last year, the Navy is about two to three squadrons short of Super Hornet. The fundamental reason for that is we have been overutilizing our aircraft over the last—mostly—close to a decade without replacing them in the numbers that we need to. And that overutilization was done in support of our ground wars in two countries. That attrition of 35 to 35—35 to 39 aircraft a year was highlighted by Admiral Greenert last year when he said 2 to 3 squadrons to fill that hole.

The Super Hornet is a vastly capable airplane that will complement the F–35C going forward through the decade of the 2020s into the 2030s, and as our statement notes, the predominance in numbers until the mid-2030s is going to be in Super Hornet as we continue to flow the F–35Cs into the air wing going through the decade of the 2020s. The complementary capability of those Super Hornets, along with the F–35C, gives us our striking power, our reach off the aircraft carrier.

It is vital to maintain a viable line at St. Louis for the Super Hornet for the near term here, in order to get those numbers into the air wings that we need to, and then to extend the force out through the 2030s until we get to a predominance of F–35C. And so acquiring those airplanes—and thank you very much to the subcommittee and the overall Congress for getting those extra Super Hornets to replace the numbers that we have flown.

Also, the extra Super Hornets over the next several years covers the slide in initial operational capability F–35C to the right. We have had previous IOCs of the F–35C planned for several years

earlier. This slide in F–35C capability to the 3F software block of the airplane is such that we have had to continue to buy Super Hornets to keep the capability in our air wings high. So it is vital to maintain that line open, sir.

Mr. GRAVES. We can actually go beyond that, too, and that is one of the things I worry about throughout all branches of the military is backfilling our used-up equipment. We have got a real problem with that and it worries me. And I'm obviously more interested in aviation than I am other areas, but thank you for your comments very much.

Thank you, Mr. Chairman. I yield back.

Mr. TURNER. Representative Graham.

Ms. GRAHAM. Thank you, Mr. Chairman.

Thank you all very much for being here.

We went on a trip, this subcommittee, to Eglin, and one of the concerns that was raised was about the maintenance system for the F–35, acronym ALIS [Autonomic Logistics Information System]. And it seemed like there were a lot of challenges that were being faced, and we have already talked about some of the maintenance issues that allow our jets to be ready to fly when we need them.

Can you give an update on where we are with ALIS? Thank you.

General DAVIS. Yes. Eglin is the—where VFA–101 is, I think. The Marines have moved out. Our squadrons are now up in Beaufort; and Yuma, Arizona; and soon to be in Iwakuni, Japan. And we also have systems up—aircraft up at Edwards with our operational test unit.

We are achieving the kind of success rates we need to right now with ALIS. We have one workaround that we have found, we worked on with our operational readiness inspection. And our IOC declaration was the one thing that you still got to do is you have got to use a laptop computer to download the engine numbers you need to after the flight.

But for the most part, a lot of the ALIS is understanding the system and also the training for your enlisted maintainers. So we have some really good maintainers that know ALIS really well. No system is without its flaws, but we are not finding the debilitating problems with ALIS out there.

And the big thing we are finding is our turnaround times were inside 2 hours. If I have the parts then we can make the turnaround, but if I don't have the parts we are not making that.

So I think that—and we also took an expeditionary deployable ALIS up to Twentynine Palms. It was one of the things we talked about out there, as well.

So we got your main base; we are putting them on the Navy ship, the L-class ships and the carriers. And also we had one we wanted to take up so we could be light and austere.

Some of the initial reports were that it had a lot of bandwidth limitations out there. I think part of that, too, is how we train our Marines. We are using some of those same pipes for our communications out there, and I think probably limiting the number of things that we download outside of the work stuff we need to do is going to allow us to get the ALIS information we need in a timely manner.

So we are not losing sorties for ALIS right now, that I am being told about. And our turnaround time is actually quite good. Not without problems, but not impossibility out there. So thank you.

Ms. GRAHAM. Anyone else have a comment about ALIS, not ALIS? Sorry. I mispronounced it——

General DAVIS. You might have said it right; I might have said it wrong. I don't know.

Ms. GRAHAM [continuing]. So many acronyms, y'all. Very——

General DAVIS. Right. There are too many.

Ms. GRAHAM. Another question, just this might seem like common sense, but I, you know, I hear that you all are saying that the—our pilots are not getting enough training time. What do you all think that does for our vulnerability from a security standpoint?

Admiral MANAZIR. Ma'am, thanks for the question.

We both testified earlier, as—right after the opening statements, that we are losing training time in the phases leading up to deployment. What that affects is our surge force. And so if we keep our deployed readiness up high, as we do in both services, and we are on the front lines with those forces, if something were to happen and we were required to surge forces from the United States, those forces are not as adequately trained now and we would have to put a whole bunch of resources in there to fly—to upgrade the flying of those forces to be able to surge behind.

That goes across—for the Navy that goes across our carriers, our air wings, our parts, or the full resourcing piece. So the combined effect of the under-resourcing of readiness accounts, spares, all the accounts across the board, is such that our surge force is not going to be recovered for a little while here.

We are targeting specific areas in that surge resourcing to be able to get to a surge number by the end of this decade and get back up to where we expect to be for the backup, the reserve, the surge forces. That is where we see that impact.

General DAVIS. Ma'am, for the United States Marine Corps, again, it is our deployment model. We are supposed to maintain a baseline readiness of this 70 percent, and the hours kind of what we pay for our flight hour dollars, I can't execute the flight hour dollars because I don't have the flying—up-flying machines to do the job.

Again, every—is a little different. Your F–18—legacy F–18, coming out of the depot; Harriers is the parts. But it extends throughout Marine aviation.

So I will tell you that we have a very codified and good training system. It is 1,000 times better than when I came in as a young guy in 1982. But our pilots, men and women, are not getting enough looks at the ball. They are not getting enough flight time experience out there to be ready to be that across-the-ROMO [range of military operations] force to the degree we need to.

We train really hard. We are working incredibly hard to make our next-to-deploy unit go out the door ready to go, whether it is on a carrier, because we have got F–18s and soon-to-be F–35Cs will go on Navy carriers. And our regular strike fighter is going out there for our unit deployment program to Japan, Special Purpose Marine Air-Ground Task Force in the Middle East, and then all of

our new deployments—we are making those deployments just in time.

And I look at the amount of risk, operational risk, and the wear and tear on the Marines and their families by doing it that way. There is no margin in my cupboards anymore. So any kind of help that you could give us in the sustainment accounts, any kind of help you can give us in recapitalizing our fleet—the old airplanes are great, but they don't stay up as long as they should.

A new airplane, properly sustained, will give us that long life we need. A lot of the airplanes we're flying—you know, we brought the F–18 into the Marine Corps in 1981, the Harrier in 1983. We have got an—we have extracted maximum value out of those platforms, and we will continue to do so until we turn them in.

And we have done our readiness recovery models to make sure we do do that and we get the readiness numbers we need to both in F–18 and Harrier. But we do need to recapitalize and sustain that system as quickly as we can.

I worry about the training base. I also worry about my pilots leaving the Marine Corps because they are not getting enough flight time. These are the best and brightest that our Nation has produced, and I—it is probably the Air Force and the Army, as well. Great young people, they joined to fight; they joined to be good at what they do.

It is like a quarterback—you know, the—all the great quarterbacks want all the snaps. Our pilots want all the snaps.

An F–18 pilot in the Marine Corps should get 16 hours of snaps a month and he is getting 10. You know, and they are not as good as they should be.

Admiral MANAZIR. And I want to add just something for the committee. Our standard is very, very high for readiness. General Davis talked about the standard that changed between when we both came in in 1982 to right now. We match our readiness against that standard.

Your Navy and Marine aviation can beat any foe anywhere in the world hands down without trying. We train to that standard, and that standard is what we're indexing to see if we are there.

So our standard is very high. We want to achieve that standard without having to lower that bar, and that is why we tell you that we need more readiness dollars and resourcing and a focus on that standard to maintain our overmatch of any adversary in the world.

Mr. TURNER. Representative Duckworth.

Ms. GRAHAM. Thank you.

Ms. DUCKWORTH. Thank you, Mr. Chairman.

Gentlemen, thank you for being here.

I would like to follow up on what my colleague from Louisiana, Mr. Graves, was touching on in terms of the shortfall of F–18s. Given all the different moving parts, basically, you know, in light of the current inventory of aircraft spare parts, crew, maintainers, do you have enough to support current demand—operational demand?

General.

General DAVIS. Yes, ma'am. On the F–18 I will probably try to answer for the Harrier, as well.

We have the inventory of pilots we need. We are under-resourced right now in F–18 pilots because for a small period there we took jets out of the training squadron to make operational commitments. We have stopped that, so our training base is sound. Now we are producing the number of F–18 pilots we need.

But I am not getting them the looks at the ball, like we talked about. Same thing with the Harrier pilots.

Our enlisted maintainers—those are the ones I focus on the most——

Ms. DUCKWORTH. Yes.

General DAVIS [continuing]. My master wrench-turners. I will tell you that we talked about spare parts, we talked about depot, we talked about in-service repair. The fourth pillar of that, for sustaining a legacy or a new airplane, is the quality of the maintainer.

We've got great Marines and sailors. We are focused now on how do we retain those very best Marines and sailors, and how do we make sure they have got the right promotion opportunities and training opportunities to do that stratified training, much like our aviators do.

I commanded the weapons school, and in 1978 with the weapons school they said, "We need to do this, to make better Marine aviators." At the same time they said, "We need to make a schoolhouse like that for our maintainers, the patch-wearers, the train-the-trainer."

We didn't do that. We are doing that now. And the first class is going out at the weapons school in conjunction with the WTI [Weapons and Tactics Instructor] class to train that E–8 senior Marine to be the train-the-trainer to retain our very best and brightest.

I think we don't have enough parts, we don't have enough airplanes. We have the human capital we need; we just need to give them the tools to be as good as they can be.

Ms. DUCKWORTH. And how does that affect your Reserve forces and the folks? You know, because as they leave Active Duty, the tempo, the quality of life, whatever it is, they decide to leave and you want to retain them in some way possible, so the Reserve forces is really a good place to keep those—to keep folks operational and in the game. How does the lack of parts, aircraft, school slots, all of that, help your—affect your Reserve forces?

General DAVIS. Reserves are a critical component to our fleet. In fact, two of the TACAIR squadrons the Marine Corps will have are—we have two Reserve squadrons. One is cadred right now; I don't have enough airplanes.

And VMFA–112 has less than half the airplanes it is supposed to have. So it impacts the amount of flight time those pilots can get; it detracts the desire to go out front, leave from the Active Duty force to go to the Reserves. And frankly, we are looking—we are not getting enough looks at the ball so the normal experience level you are looking for a reservist to go there, a lot of these guys don't have it as much as they needed to.

Ms. DUCKWORTH. Right.

General DAVIS. Lieutenant General Rex McMillian and I have worked in this very closely. Bottom line is, as go the Active fleet goes the Reserves. So if we are hurting in the Active force we are

going to be hurting in the Reserve. We are rebuilding the Reserves the same time we are rebuilding the Active fleet.

Ms. DUCKWORTH. So as the shortfall in F–18s, for example, across the service is happening, is—are you showing the same percentage of shortfall in the Reserves and Active fleet, or is it coming more—you are talking about you have a whole squadron that is not flying right now in the Reserves.

General DAVIS. We cadred that squadron getting ready to stand up the F–35.

Ms. DUCKWORTH. Okay.

General DAVIS. But VMFA–112—and we did a kind of a force reduction to deal with the systems we have right now have got 19 squadrons of—1 F–35 squadron, 1 Reserve F–18 squadron, 6 Harrier squadrons, and 11 F–18 squadrons right now in my inventory, and those are all legacy F–18s, plus the 2 training squadrons that go along with that.

We will have two Reserve squadrons at end game. They will be F–35 squadrons, one at Beaufort and one at Miramar—or one at Cherry Point and one at Miramar. So building them up is critically important to us.

And again, I think the Reserves is our buffer, right, and they are also part of our Active force. So making them healthy, making them as good as they can be is critically important to the future of the Marine Corps.

We have got to fix the Reserves the same time we are fixing the Active fleet while making—right now making our operational commitments, and doing that as well as we can. In fact, our Reserve squadron is at Beaufort this week participating in the Marine Division Tactics Course, which is basically training our division of air-to-air pilots to go be as good as they can be, and they are out there in force with the airplanes they have, totally integrated with the Active Duty Component, being assessed and evaluated like the young captains are at Beaufort. And generally they do very, very well.

But we need to get them more inventory and more parts so they can do their job well.

Ms. DUCKWORTH. Admiral, did you want to add anything?

Admiral MANAZIR. Ma'am, for the United States Navy a similar type of thing. We have a—our full requirement of pilots, both Active and Reserve. We have our full requirement of maintenance personnel, both Active and Reserve.

Where we suffer is the jets. As I described, we fully resource deployment and advanced training, and then we are unable, because of jet availability, to fully resource the basic phases.

That also extends to the Reserves. So we are unable to fully resource the Reserves, so of their 10 jets—we have 2 Reserve squadrons. One is a blue backup that would—will continue to be trained to go on deployment in case we can't send an Active squadron, and the other one is primarily an adversary squadron. Both do adversary duties for us, fighting—playing like they are opposing forces.

The availability of jets is a problem in the Reserves and the lower-level phases of our pre-deployment training. The proximate causes of that are parts, and the depot throughput that we have already talked about. And the proximate cause of the depot

throughput, from a personnel standpoint, is artisans and engineers that we have had to hire since sequestration to make the depot flow continue.

So our near-term readiness problem is the depot throughput. We continue to get better. We are 44 percent better this year than last year—or 2015 over 2014. We continue to get better and push those F–18Cs out to Navy and Marine Corps squadrons so that we can resource them properly with hardware and properly train the pilots.

But the specific answer, ma'am, for Active and Reserve for the Navy is we have all the people that we need. It is the jets that we need to do—continue the training.

Ms. DUCKWORTH. I feel strongly that this Congress has—and previous Congresses has seriously done you a disservice by asking you to live up to an operational tempo, but not providing you the resources that you need. You don't have to respond to that. That is a political statement, and——

Mr. TURNER. Your time is up. Just let me say I agree. And certainly that is——

Ms. DUCKWORTH. Thank you, Mr. Chairman.

Mr. TURNER [continuing]. It is the budget battle time.

Ms. DUCKWORTH. Yes.

Mr. TURNER. This is the time for us all on this committee to make certain that our voices are heard to the other Members——

Ms. DUCKWORTH. Yes.

Mr. TURNER [continuing]. Of Congress so that hopefully we can get more resources, because this is not just, you know, inefficiency that is resulting in these falloffs; it is absolutely resources.

And Congresswoman Tsongas gets our last question.

Ms. TSONGAS. Thank you, Mr. Chairman. I appreciate the opportunity to follow up again on some of the issues on the F–18.

First of all, I appreciate, Admiral Moran, your talking about the manual backup oxygen system, but I think we all would be concerned by the fact that you are asking a potentially incapacitated pilot to sort of help himself out of this. And it is my understanding that that would only give him 10 minutes, were he able to exercise it appropriately, and you would have no idea how far away he might be from the carrier or wherever he needs to get back to.

So as you are looking at creating a budget, I think an automatic system is something that you might—I am sure you said you are thinking about it, but it seems to me that would give him much more time and he wouldn't have to activate it—or he or she would not have to activate it themselves.

Another question, though: I know last year's NDAA authorized 12 additional F–18s, so how is the Navy—and this is for you, Admiral Manazir—how are you making sure that these new planes aren't delivered to the Navy without the same on-board oxygen system problems that you are struggling with today?

Admiral MANAZIR. So, ma'am, thank you very much. Those new Super Hornets are coming off the production line with the newest modifications that NAVAIR and Boeing are working through, and it is a combination Boeing-Navy team that is looking at this OBOGS system very, very hard.

As soon as the technical work is done, the engineering work, to do these new parts—and Admiral Moran talked about them, the sieve and the regulator, the things that we think might be causing some of this—they get rolled into the production line. And then even when they get on the flight line we put those parts in there, too.

So I am confident that the best technical minds in NAVAIR and also in Boeing are looking at this and we will roll those into the airplanes as they get to the fleet. And again, I have to tell you, ma'am, I have a lot of confidence in the airplane, having flown it.

Ms. TSONGAS. And how will you be assured that all these fixes are working?

Admiral MANAZIR. We will continue to monitor; we will find better ways to monitor. We will continue to have pilots report. We will look at that decline in reports.

We will turn over every rock, every technical rock, that we can to make sure that we are going after every causal factor.

It is difficult to prove a negative. So if a pilot doesn't have a physiological event time after time after time—and again, ma'am, I have never had one ever and I have 3,500 hours in fighters.

And so when somebody comes back and they say, "Well, did we fix it? Nobody has had an event," and then all of a sudden we have an event, now we have to go back and see where the trend lines go.

I have——

Ms. TSONGAS. Are you comfortable with the reports you are getting that you are being—getting an accurate sense of what the problem is out there?

Admiral MANAZIR. Yes, ma'am. I think so. It is difficult because if a pilot is a little bit woozy, his recollection of the, you know, the exact leading up to, you know, what altitude were you, what were you doing, what did you—did you sense anything in the cockpit? So in our post-flight debriefs the flight surgeon talks to them as well, so we try to get as much fact as we can to then guide us in a scientific manner towards a cause.

I am comfortable we will get there, but we are not going to stop.

Ms. TSONGAS. Thank you.

I yield back. And thank you, Mr. Chairman.

Admiral MORAN. Yes, ma'am. I just want to——

Ms. TSONGAS. Oh, go ahead.

Admiral MORAN [continuing]. It is okay, ma'am.

You know, when you say how are we going to know, I mean, all—part of this process we have developed some test procedures and test units to go check our pressurization systems and check our OBOGS systems that we didn't have currently. So when we accept the airplane off the line we will use those systems, as well, to validate the performance as best we can on the ground.

We didn't have those before. We have them now, so we are leveraging them.

And I will tell you, you know, it is really for us I think the kicker is can we really monitor, you know, what the gas the pilot is getting, is there any contamination in there, as I said earlier. So we do have some tools that we are employing now on our test squadrons to start—collect that data.

As Admiral Manazir said, it is hard to get that data when an air crew lands, to really know what they were breathing at the time they had that event. So we are trying to put some things in the airplane.

So we are, right now today in our test squadron, starting to employ those to see if they are of value, and so that we can start getting them out into the field. So we are looking at that continuing to evolve to make the awareness piece, you know, the critical factor so it is not a surprise. They can tell it is coming on or get indications from the system on the airplane that it is coming on.

Ms. TSONGAS. I guess a concern we would have that we would be paying for planes that still had this problem and put the pilots at risk. Thank you.

Mr. TURNER. With that, we will be adjourned.

[Whereupon, at 11:11 a.m., the subcommittee was adjourned.]

A P P E N D I X

FEBRUARY 4, 2016

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

FEBRUARY 4, 2016

Statement of the Honorable Michael Turner
Chairman, Subcommittee on Tactical Air and Land Forces
Naval Strike Fighters—Issues and Concerns
February 4, 2016

The hearing will come to order.

The subcommittee meets today to receive testimony on issues and concerns regarding the strike fighter fleets for the Department of the Navy.

I'd like to welcome our distinguished panel of witnesses:

- **Lieutenant General Jon M. Davis, Deputy Commandant of the Marine Corps for Aviation**
- **Rear Admiral Michael C. Manazir, Director of the Air Warfare Division for the U.S. Navy**

and

- **Rear Admiral Michael T. Moran, Program Executive Officer for Tactical Aircraft**

I thank you all for your service and look forward to your testimony today.
We are here today to talk about the Department's Strike Fighter programs, but I wanted to take a moment to pause and remember the tragedy of January 14th in Hawaii when we lost 12 Marines and two CH53Es. We must do everything in our power to ensure the readiness and safety of our young men and women in uniform.

At the outset, I would note that the Department of Defense will not release it fiscal year 2017 budget until next Tuesday. Accordingly, I expect that our witnesses will not be able to discuss details of the upcoming budget request. However, if Members do have questions about the budget which are taken for the record, I would ask our witnesses to respond to those Members promptly after the budget is submitted to Congress.

We have several issues to cover today, but in my opening remarks I want to highlight two committee concerns—the Navy's strike fighter shortfall and the issue of physiological episodes in the F/A-18 fleet.

In hearings last year for the fiscal year 2016 budget request, Admiral Greenert, then the Chief of Naval Operations, described a requirement to procure an additional "three squadrons" of F/A-18E/Fs, or about 35 aircraft. Additionally, the Marine Corps' unfunded requirements list included six F-35B aircraft to replace six AV-8B aircraft destroyed at Bastion Airfield in Afghanistan when the enemy broke through Marine defenses in September 2012.

This Committee and the Congress heard that call. For fiscal year 2016, the Committee added 12 F/A-18E/F aircraft and six F-35B aircraft. The National Defense Authorization Act signed into law in November of last year reflects those increases. The Consolidated Omnibus Appropriations Act for Fiscal Year 2016 included those authorized increases and added two more F-35C aircraft for the Navy.

We know that helped to alleviate some of the Navy's strike fighter shortfall, and the fifth generation fighter increases will improve the Navy's warfighting capabilities. We look forward to hearing more from our witnesses on how these increases helped, and how much more we need to do.

Since 2009, the Department of the Navy has noticed a rise in hazard reports, known as HAZREPS, regarding physiological episodes in the Navy's F/A-18 and EA-18G fleets.

According to the Navy, physiological episodes occur when a pilot experiences a loss in performance related to insufficient oxygen, depressurization or other factors present during flight.

We've been informed that the Navy has organized a Physiological Episode Team, to investigate and determine the causes of these physiological episodes in aviators. As symptoms related to depressurization, tissue hypoxia and contaminant intoxication overlap, discerning a root cause is a complex process.

We understand that determining the root cause or causes of physiological episodes in F/A-18 aircraft is a work in progress. We look forward to learning more today about how the Navy is addressing this important issue and to what we as Members of Congress can do to help with that process.

Before we begin, I would like to turn to my good friend and colleague from Massachusetts, Ms. Niki Tsongas, for any comments she may want to make.

NOT FOR PUBLICATION UNTIL RELEASED BY THE
HOUSE ARMED SERVICES COMMITTEE
TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

STATEMENT OF

LIEUTENANT GENERAL JON M. DAVIS
DEPUTY COMMANDANT FOR AVIATION

AND

REAR ADMIRAL MICHAEL C. MANAZIR
DIRECTOR AIR WARFARE

AND

REAR ADMIRAL MICHAEL T. MORAN
PROGRAM EXECUTIVE OFFICER, TACTICAL AIRCRAFT

BEFORE THE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

DEPARTMENT OF THE NAVY'S STRIKE FIGHTER PROGRAMS

February 4, 2016

NOT FOR PUBLICATION UNTIL RELEASED BY
THE HOUSE ARMED SERVICES COMMITTEE
TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

INTRODUCTION

Mr. Chairman, Ranking member Sanchez and distinguished members of the subcommittee, we thank you for the opportunity to appear before you today to discuss the Department of the Navy's (DoN) Strike Fighter programs. This statement addresses the DoN Strike Fighter requirement as well as efforts to recapitalize the force. Appendix A includes an overview of related physiological episodes and aircraft mishap data.

While your invitation to appear before the committee is focused on DoN Strike Fighter issues, we note that Aviation readiness is in a precarious position that extends well beyond the Strike Fighter force structure – it is particularly acute in the United States Marine Corps. Marines are flying, on average, 58 percent of the required flight time necessary to be ready for the Nation's call.

STRIKE FIGHTER INVENTORY MANAGEMENT

The Department remains challenged with end of life planning for F/A-18A-D and AV-8B aircraft that reach the end of their service life before replacement aircraft can be fully delivered into service. To keep pace with the issue and provide high-fidelity analytical rigor to decision makers, DoN transitioned to the Naval Synchronization Tool (NST) in 2014. This inventory modeling and forecasting tool better informs the Strike Fighter Inventory Management (SFIM) planning and the budgetary programming process.

The Strike Fighter inventory should be viewed in two separate and distinct phases. The near term challenge is managing a DoN TACAIR force that has been reduced in capacity through a combination of reduced Strike Fighter aircraft procurement, higher than planned TACAIR utilization rates, under resourcing sustainment and enabler accounts resulting in inadequate availability of spare parts, and F/A-18A-D depot production falling short of the required output. As a result of aggressive efforts instituted in 2014 across the Department to improve depot throughput and return more aircraft back to service, fiscal year (FY) 2015 depot throughput improved by 44 percent as compared to FY14, returning to pre-sequestration levels of production. TACAIR aviation depots are expected to continue to improve productivity through

2017, and fully recover the backlog of F/A-18A-D aircraft in 2019 at which time the focus will shift toward F/A-18E/F service life extension, F-35 repair, and the rest of the DoN aircraft inventory. In a similar effort to increase Harrier aircraft availability, the Department conducted a Harrier Independent Readiness Review (HIRR) which identified a need for changes in the Harrier sustainment plan to achieve required flight line and inventory readiness. This year, with Congress' support, the Department is implementing these changes to return Harrier readiness to required levels.

In the far term, the Strike Fighter inventory is predominantly affected by new aircraft procurement – FA-18E/F and F-35. Combatant Commander (COCOM)-driven operations and Fleet Readiness Training Plan (FRTP) requirements are driving an increased Strike Fighter utilization rate that currently outpaces procurement. Mitigation strategies, such as reducing utilization on current aircraft, are being examined by Commander, Naval Air Forces. Nonetheless, the DoN Strike Fighter force continues to meet Global Force Management (GFM) operational commitments. We anticipate inventory pressure to remain relatively constant through the future as we experience peak depot inductions of F/A-18A-D aircraft reaching 8,000 hours High Flight Hour (HFH) service life extension inspections, repairs and modifications, and later as depot inductions increase significantly due to F/A-18E/F service life extensions. The continued efforts of the Naval Aviation Enterprise (NAE) will define the necessary actions required to manage the end of life of aging F/A-18A-D and AV-8B aircraft, address further discovery of greater than expected fatigue and corrosion issues, maintain their operational relevancy and ensure required availability of these aircraft until fully replaced by the Joint Strike Fighter (JSF).

The DoN Program of Record (POR) includes 680 F-35 aircraft. The Navy F-35C POR is 260 aircraft. The total Marine POR is 420 aircraft – 353 F-35Bs and 67 F-35Cs. The Navy and Marine Corps will continue to modify transition plans to adjudicate F-35 procurement changes. Sustainment and modernization funding will be required to maintain the relevant operational capability of the F/A-18A-F and the AV-8B throughout the transition to the F-35. Given the implications for the Department of Defense as a whole, the Under Secretary of Defense for

Acquisition, Technology & Logistics is also examining the long term health and viability of the TACAIR industrial base in depth.

STRIKE FIGHTER FORCE STRUCTURE

The 1,240 aircraft Strike Fighter force is the projected DoN inventory needed to support the anticipated operational demand through the 2030 timeframe. The Navy inventory requirement of 820 aircraft supports 40 active duty Strike Fighter squadrons composed of 440 aircraft (mix of 10-12 aircraft per squadron), and two reserve squadrons with 22 total aircraft assigned. In order to maintain the operational aircraft, support aircraft are required for aviator training, flight test, attrition reserve and the depot pipeline. This inventory projection is estimated based on historical averages and assumes 100 percent squadron entitlement. Through detailed analysis, inspections, and structural repairs, as required, the DoN has been successful in achieving 8,000 flight hours per F/A-18A-D aircraft, 2,000 flight hours beyond the original designed service life, and is pursuing a strategy to go as high as 10,000 flight hours on select aircraft. The inventory projection also assumes a service life extension for F/A-18E/F aircraft to 9,000 flight hours from the design life of 6,000 flight hours.

The Navy's F-35C TACAIR requirement is 260 aircraft in 18 active squadrons and one training squadron. The F-35C capabilities complement the F/A-18E/F and enhance the overall carrier-based war-fighting capabilities. This force structure supports the operational demand per the Global Force Management Allocation Plan (GFMAP) and projected aircraft carrier deployments. The Marine Corps F-35B/C TACAIR requirement is 420 aircraft in 18 active, two reserve, and two training squadrons. Integral to our current force structure reductions, our tactical aviation squadrons were restructured to optimize the support they provide to the Marine Air Ground Task Force (MAGTF). The program of record for USMC F-35 includes four F-35C squadrons that are capable of being integrated with Navy carrier air wings and fair share contribution of F-35C pilots and maintainers to the Fleet Replacement Squadrons (FRS).

F/A-18A-D Hornet:

The F/A-18A-D was designed for, and has achieved, a service life of 6,000 flight hours, performing as expected through their design life. Service life management of this aircraft intends to extend this platform beyond its designed 6,000 flight hours, achieving 8,000 flight hours per aircraft with select aircraft extended to 10,000 flight hours. Continued investment in the Service Life Extension Program (SLEP), the High Flight Hour (HFH) inspection program, and Air Systems Support (i.e. Program Related Engineering and Program Related Logistics) is crucial to our flight hour extension strategy. In order to maintain war-fighting relevancy in a changing threat environment, we will continue to procure and install advanced systems such as Digital Communication System Radios, Joint Helmet-Mounted Cueing Systems (JHMCS) and the Night Vision Cueing and Display (NVCD), High Order Language Mission Computers, ALR-67v3, ALQ-214v5, Multi-Function Information Distribution System-Joint Tactical Radio System (MIDS-JTRS), APG-73 radar enhancements, Advanced Targeting Forward looking Infrared (ATFLIR) upgrades, and LITENING targeting pods for the Marine Corps on selected F/A-18A-D aircraft.

Although the F/A-18A-D is out of production, a portion of the existing inventory of 610 Navy and Marine Corps aircraft is scheduled to remain in service through 2031. The DoN will continue to meet Navy operational commitments with F/A-18A-D until 2026 for active squadrons, 2029 for Marine Corps active and reserve squadrons, and through 2034 for Navy reserve squadrons. Using the Structural Life Management Program, fleet managers monitor and maintain the health of the legacy F/A-18A-D fleet through analyses of TACAIR inventories and the management of usage rates at the squadron level. Ninety-one percent of the F/A-18A-D fleet has over 6,000 flight hours and 19 percent (114 aircraft) have flown more than 8,000 flight hours. The highest flight hour airframe has attained over 9,575 hours and is currently conducting forward deployed operations.

The F/A-18A-D aircraft have been, and will continue to be, maintained operationally relevant through upgrades. The F/A-18A-D Service Life Assessment Program (SLAP) showed that the airframe can be flown beyond 8,000 hours and up to 10,000 hours with a combination of further

inspections and airframe modifications (engineering change proposals (ECPs)) to maintain airworthiness certification. The inspection results to date have matched the SLAP data. Depot throughput of these aircraft is complicated by the on-going discovery of corrosion, which is difficult to predict, introducing unplanned work in inducted airframes. Depot leaders have developed an aggressive plan to design and develop standard repairs for corrosion-induced work to better manage the unplanned workload during depot events.

The F/A-18A-D SLEP effort has featured a phased approach since inception, developing ECPs and inspection criteria for the most critical airframe requirements first to ensure timely fielding of priority inspections and modifications. These efforts reduce risk in airworthiness and cost while allowing for future program trade space to mitigate potential program-wide delays. To meet fleet requirements prior to the completion of the initial phases of SLEP, the F/A-18A-D airframe requires a suite of High Flight Hour (HFH) inspections designed to extend the service life beyond 8,000 flight hours. HFH inspections are required to assess the material condition and airworthiness of aging F/A-18A-D aircraft to meet resourcing requirements as aircraft reach 8,000 hours. The HFH suite continues to be revised as a result of on-going SLAP and SLEP analysis. To date, 171 HFH inspections have been successfully completed with 118 HFH inspections currently in-work. Fleet utilization of aircraft at high rates are pressurizing depot workload as increasing numbers of F/A-18A-D aircraft reach 8,000 flight hours, requiring extensive depot time to inspect, repair, and extend service life.

The Department is conducting SLEP/HFH inspections/repairs at seven locations: NAS Lemoore, CA; NAS North Island: San Diego, CA; NAS Jacksonville, FL; Boeing: Cecil Field, Jacksonville, FL; MCAS Miramar: San Diego, CA; MCAS Beaufort, SC; and NAS Oceana: Virginia Beach, VA. While less complex SLEP modifications can be incorporated at all sites, major SLEP modifications are done concurrently with major depot events.

F/A-18E/F Super Hornet:

The F/A-18E/F Super Hornet will be numerically the predominant aircraft in the Navy's carrier air wing Strike Fighter force through 2035. The F/A-18E/F began Full Rate Production (FRP) in

2000. To date, 99 percent of the total procurement objective has been delivered (562 of 568 aircraft). Continued investment funds capability upgrades with a focus on completing both Passive and Active kill-chains, significantly improving the lethality relevance of the carrier air wing. The Super Hornet modernization plan features an incremental approach to incorporate new technologies and capabilities, to include Digital Communication System Radio, MIDS - Joint Tactical Radio System, JHMCS, ATFLIR with shared real-time video, Accurate Navigation, Digital Memory Device, Distributed Targeting System, Infrared Search and Track (IRST) and continued advancement of the APG-79 Active Electronically Scanned Array (AESA) Radar.

The F/A-18E/F fleet has flown approximately 44 percent of the total flight hours available within the 6,000 hour limit design life. This fleet flight hour capacity will not be adequate to meet operational commitments out to the 2040's. As a result, Navy is designing an F/A-18E/F Service Life Assessment Program (SLAP) to determine what it would take to extend the airframe service life beyond 6,000 flight hours. Like the F/A-18A-D Hornet, the Super Hornet program is executing a three-phased SLAP which commenced in 2008 and is expected to last through 2024. The goal is to analyze fleet actual-usage versus structural test data to design a program to extend F/A-18E/F service life from 6,000 flight hours to 9,000 flight hours via a follow-on Service Life Extension Program (SLEP). The initial phases of the F/A-18E/F SLEP began in 2014 to develop and produce engineering change proposal kits to upgrade life-limited locations on the aircraft that are revealed by SLAP analysis.

The Service Life Management Plan philosophy has been applied to the entire F/A-18 fleet since 2007 to facilitate optimization and alignment of Fatigue Life, flight hours and total landings, thereby better matching aircraft service life to fleet requirement. The aircraft are managed by bureau number by the staff of Commander, Naval Air Forces (CNAF). The F/A-18E/F SLAP effort incorporates lessons learned from the F/A-18A-D analysis and was started sooner in the aircraft life cycle than the F/A-18A-D SLAP. The F/A-18E/F SLAP also takes advantage of completing a third lifetime of test cycles on certain test articles providing more detailed information on high fatigue areas earlier in the program than the F/A-18A-D.

EA-18G Growler:

The EA-18G Growler is a critical enabler for the joint force, bringing fully netted warfare capabilities to the fight that provides unmatched electromagnetic spectrum agility in an Electromagnetic Maneuver Warfare (EMW) environment. To date, 114 aircraft have been delivered, representing 72 percent of the funded inventory objective. Initial operating capability (IOC) occurred in September 2009 and full rate production (FRP) was approved in November 2009. The first EA-18G squadron deployed to Iraq in an expeditionary role in November 2010 in support of Operation NEW DAWN, and subsequently redeployed to Italy on short notice in March 2011 in support of Operation UNIFIED PROTECTOR. The first carrier-based EA-18G squadron deployed in May 2011. Since their initial deployment, Growlers have flown more than 2,300 combat missions, have expended approximately 16 percent of the 7,500 flight hour life per aircraft, and are meeting all operational commitments. Electronic attack capabilities, both carrier-based and expeditionary, continue to mature with development of the Next Generation Jammer (NGJ), which is scheduled to replace the legacy ALQ-99 Tactical Jamming System.

The recent addition of seven aircraft will extend deliveries to FY18, which is expected to fulfill Navy requirements for carrier-based airborne electronic attack and expeditionary EA-18G squadrons. A number of additional EA-18Gs, above the funded procurement objective of 160, is still under consideration as the Navy is currently exploring solutions that optimize the Growler procurement plan to support an AEA force structure to meet the joint requirement.

AV-8B Harrier:

The current Marine Corps inventory consists of 131 AV-8B Harrier aircraft. This includes 34 Night Attack and 79 Radar aircraft, 16 TAV-8B trainers, one Day Attack upgrade, and one Center for Naval Aviation Technical Training (CNATT) maintenance trainer. These aircraft support six operational squadrons of 14 aircraft each (PMAA of 84). The inventory decline is the result of September 2012 combat losses at Bastion Airfield, Afghanistan. This attack accounts for the loss of eight AV-8Bs; six destroyed, two damaged. To date, the AV-8B fleet is averaging 12 aircraft out-of-reporting for Planned Maintenance Interval (PMI) and special re-

work, with a five-year average of 18.1 percent per year. Most importantly, the Harrier has suffered from inadequate supply support, driving down the number of aircraft that can train, deploy, and support our Marines.

The AV-8B was originally designed as a 6,000-hour airframe with expected service life through 2012. In 2010, the Department transitioned to a Fatigue Life Expended (FLE) model that more accurately measures actual stress history on individual airframe components, enabling the airframe to fly beyond 6,000 hours. Fleet average for all three single-seat variants of the AV-8B Harrier is 34.6 percent FLE; there is sufficient airframe life left in these aircraft to reach their eventual end of service. Sub-contractors and vendors divested manufacturing lines of AV-8B material in anticipation of the 2012 sundown. Delays in F-35 procurement, coupled with F/A-18A-D out-of-reporting challenges led to changes in the Marine Corps' TACAIR transition order shutting down one FA-18 squadron early and extending the service of the AV-8B to mitigate a growing USMC TACAIR inventory shortfall.

Due to component obsolescence concerns and supply shortfalls, the Department purchased 57 GR-9 aircraft, 38 MK-107 engines, parts supply, and support equipment from the United Kingdom in 2011. The GR-9 buy was meant to fill a supply gap allowing NAVSUP immediate access to supply inventory, to develop long term sustainment strategies and give industry time to re-develop parts production lines to support the AV-8B until transition to the F-35 is complete. To date, over 68,000 parts exceeding $51 million have been used from the GR-9 purchase. This decision had an immediate impact in reducing supply backorders. However, a reduction in demand signal from the GR-9 and other lifetime-type buys may cause additional reduction in sub vendors and supply contractors unless carefully managed.

The AV-8B continues to be in high demand deploying in support of COCOM requirements and operational contingencies. Each Marine Expeditionary Unit (MEU) deploys with embarked AV-8Bs. AV-8B and F/A-18A-D squadrons alternate in support of Special Purpose Marine Air-Ground Task Force (SPMAGTF) deployments. Harriers deploy with 10-aircraft squadron sized units, with their remaining six aircraft at sea with a MEU. They are flying and leading joint and coalition strikes in Iraq and Syria today.

The AV-8B, equipped with LITENING targeting pods and a video downlink to ROVER ground stations, up to six precision strike weapons, and beyond visual range air-to-air radar missiles, has continued to be a proven, invaluable asset for the MAGTF and joint commanders across the full spectrum of operations. During the first half of FY15, the AV-8B received the H6.1 Operational Flight Program (OFP) enabling full integration of the Generation 4 LITENING targeting pod. During 2015, the program continued work on the H6.2 Operational Flight Program, which will integrate the initial Link 16 message sets. Additionally, this OFP will integrate Federal Aviation Administration (FAA) compliant RNP/RNAV capability and correct additional software deficiencies identified through combat operations. Work continues on H7.0 OFP as well, which will complete the integration of Link 16. The Airborne Variable message Formal (VMF) terminals will be installed in AV-8Bs to replace the current digital-aided close air support (CAS) technology and additional efforts include tactical datalink and sensor improvements in support of operational contingencies until transition to the F-35. As an out-of-production aircraft, the AV-8B program will continue its focus on sustainment efforts to mitigate significant inventory challenges, maintain airframe integrity, achieve full FLE, and address reliability and obsolescence issues of avionics and subsystems.

F-35 Lightning II:

The future of DoN TACAIR relies on a combined total of 680 F-35B and F-35C fifth generation aircraft that are part of the larger joint F-35 program. More than just the next fighter, the F-35 brings unprecedented low observable technology, modern weaponry, and electronic warfare capability to the Navy and Marine Corps. Marine Fighter Attack Squadron 121 achieved the world's first operational capability last summer with the F-35B, and will deploy within the next year to defend the Nation's interests abroad. Marine Fighter Attack Squadron 211 will stand up in the months ahead. The Navy will achieve Initial Operational Capability with the F-35C carrier variant in August 2018, the Marines operational in 2020, and together replace our aging aircraft inventory with the greatest practical speed.

The Marine Corps operates the STOVL variant of the F-35, the F-35B. The fielding of the F-35B continues to make excellent progress due to the combined efforts of the Department,

industry, and Congress. Critical Military Construction (MILCON) at our bases and stations, both at home and overseas is underway to support the fifth generation capability, and the men and women who operate and maintain the aircraft are ready. The Department is starting to train with the F-35B at our most advanced weapons schools while exercising the expeditionary capability the STOVL variant in particular represents. The F-35 employs a block upgrade program to usher in new and advanced war-fighting capabilities. From strike, to CAS, to counter air, escort, and electronic warfare – this machine is the key to our future – empowering our maritime forces to fight from sea bases and expeditionary bases ashore in any clime and place, against any foe. The F-35 is a Strike Fighter the Department needs, although we must get the spare parts posture right, along with the rest of the supporting logistics to take full advantage the aircraft's full capability.

CONCLUSION

The Navy and Marine Corps aviation fleet is an agile maritime strike and amphibious power projection force in readiness. Such agility requires that the aviation arm of our naval strike and expeditionary forces remain strong. Mr. Chairman, and distinguished committee members, we appreciate your continued support of our Naval Aviation programs and we look forward to working with you to build the force of the future.

Appendix A: Aviation Mishap Data

F/A-18 AND EA-18G PHYSIOLOGICAL EPISODES

Physiological events occur when aircrew experience a decrement in performance, or symptoms while airborne related to disturbances in tissue oxygenation, depressurization or other factors present in the flight environment. These phenomena jeopardize safe flight.

As a result of physiological episodes, the F/A-18 Program Office (PMA-265) established a Physiological Episode Team (PET) to investigate the root causes associated with F/A-18A-F and EA-18G aircraft. The core F/A-18 PET is comprised of 17 members of PMA-265, 23 members from the Fleet Support Team (FST) at NAS North Island, 14 members of the FST at MCAS Cherry Point, three members from the Aircrew Oxygen Systems In-Service Support Center, 10 engineers affiliated with NAVAIR 4.3's Environmental Control Systems (ECS) team and 21 members associated with NAVAIR 4.6's Human Systems team. The F/A-18 PET works closely with other program offices, cross-service affiliates and industry partners in evaluating each episode.

The NAVAIR PET is currently addressing hypoxia and decompression sickness (DCS) as the two most likely causes of recent physiological episodes in aviators. As symptoms related to depressurization, tissue hypoxia and contaminant intoxication overlap, discerning a root cause is a complex process. While episodes of decompression sickness typically accompany a noticeable loss of cabin pressure by the aircrew, the cause of most physiological episodes is not readily apparent during flight. Reconstruction of the flight event is difficult with potential causal factors not always readily apparent during post-flight debrief and examination.

Historical data of F/A-18 physiological events prior to May 2010 is based on safety reports. The problem was not well known among pilots at the time, and the low rates prior to 2010 may actually be indicative of low reporting rates rather than low rates of occurrence. The rate per 100,000 flight hours during FY06-FY10 based on safety reports follows:

Date Range	F/A-18A-D	F/A-18E-F	EA-18G
FY06	3.66	2.18	0.00
FY07	1.63	3.73	0.00
FY08	3.72	4.28	0.00
FY09	6.19	8.33	0.00
FY10	4.95	11.96	0.00

In May 2010 PMA-265 established the PET to investigate root causes of physiological episodes while Commander, Naval Air Forces specific reporting procedures to collect more data on the occurrence of an event. The rate per 100,000 flight hours beginning in May 2010 with the implementation of new reporting protocol follows:

Date Range	F/A-18A-D	F/A-18E-F	EA-18G
05/1/2010 - 10/31/2010	12.20	8.98	0.00
11/1/2010 - 10/31/2011	10.90	8.65	5.52
11/1/2011 - 10/31/2012	16.39	23.35	5.42
11/1/2012 - 10/31/2013	21.01	26.23	9.80
11/1/2013 - 10/31/2014	29.54	26.39	15.05
11/1/2014 - 10/31/2015	28.23	28.54	43.57*

* The excessive rate for EA-18G appears to be a statistical anomaly (high variance in a small data set) nevertheless we are taking the discrepancy seriously and investigating any possible root cause.

The process for investigating a physiological episode begins with the submission of data describing the event. Engineers from the Environmental Control System (ECS) FST and the Aircrew Oxygen Systems In-Service Support Center work with the squadron maintenance department to identify which components of the aircraft should be removed and submitted for engineering investigation. The squadron flight surgeon also submits data on the medical condition of the pilot and in-flight symptoms that were experienced.

After completion of the component investigations the incident is examined holistically by members of the engineering teams and Aviation Medical specialists to identify the most likely cause of the incident. Of 273 cases adjudicated by the PET so far, 93 have involved some form of contamination, 90 involved an ECS component failure, 67 involved human factors, 41 involved an OBOGS component failure, 11 involved a breathing gas delivery component failure, and 45 were inconclusive or involved another system failure. Of note some of the events resulted in assignment to more than one category.

A variety of actions have been undertaken to address the occurrence of physiological episodes in the F/A-18. New maintenance rules for handling the occurrence of specific ECS built-in test faults have been implemented throughout the fleet requiring that the cause of the fault be identified and corrected prior to next flight. Mandatory cabin pressurization testing is now performed on all F/A-18A-F and EA-18G aircraft every 400 flight hours and ECS pressure port testing is performed on all F/A-18A-D aircraft every 400 flight hours. Overhaul procedures for ECS components and aircraft servicing procedures have been improved. Emergency procedures have been revised and all pilots now receive annual hypoxia awareness training, and biennial dynamic training using a Reduced Oxygen Breathing Device (ROBD) to experience and recognize hypoxia symptoms while safely on the ground. Many other solutions are in the process of being fielded or under development as well. Internal components of the F/A-18 OBOGS have been redesigned to incorporate a catalyst to prevent carbon monoxide from reaching the pilot and should be installed fleet-wide in the next year. The bleed air detection system is being rerouted to eliminate false alarms that can shut down the ECS system and potentially cause DCS. A new oxygen monitor with increased capability is preparing to enter flight testing and a new component life management strategy for ECS components is also being developed. Studies are in progress to reroute Radar Liquid Coolant discharge ports and replace components that could be sources of contamination within the ECS. Future projects include technology to collect better sample data throughout the ECS and OBOGS, increased capacity for the emergency oxygen bottles, and physiological detection of symptoms.

SUMMARY OF CLASS A, B AND C AVIATION-RELATED SAFETY ISSUES

A summary of all Naval Aviation Class A, B and C aviation-related safety issues, including recent mishaps, trends, and analysis from October 2014 through January 14, 2016 follows. The rates presented are based on mishaps per 100,000 flight hours.

YEAR	Flight Hours	Class A	Class A Rate	Class B	Class B Rate	Class C	Class C Rate
FY15	1,101,692	16	1.45	14	1.27	81	7.35
FY16	295,504	4	1.02	2	0.68	25	8.46

The most recent FY16 DoN flight Class A mishaps include:

- 14 Jan 2016: (Kaneohe Bay, HI) two CH-53E helicopters crashed in water; 12 military fatalities.
- 12 Jan 2016: (Fallon, NV) F/A-18A had engine fire leading to ejection and crash; pilot ambulatory.
- 09 Dec 2015: (Southern California) MV-22B landed short while recovering to LPD; no injuries.
- 21 Oct 2015: (RAF Lakenheath, England) F/A-18C crashed on departure; no civilian casualties; one military fatality.

There are no recent FY16 DoN Class A flight related mishaps (FRM). There is one recent FY16 DoN Class A aviation ground operations mishap (AGM):

- 18 Oct 2015: (WESTPAC) Electrical arcing at vapor cycle power receptacle led to E-2C fire in the hangar bay; no injuries.

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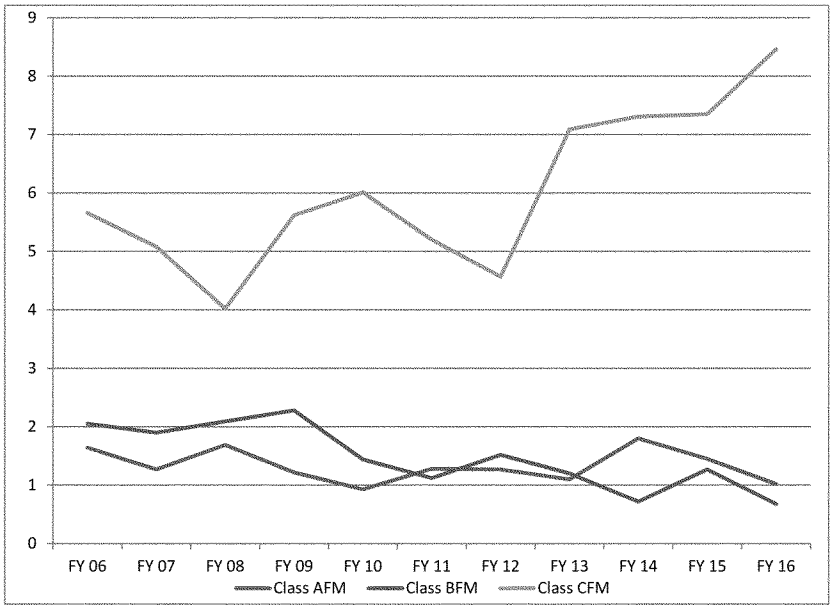
DoN Historical Mishap Rate Trend per 100K Flight Hours per Mishap Class
(As of January 14, 2016)



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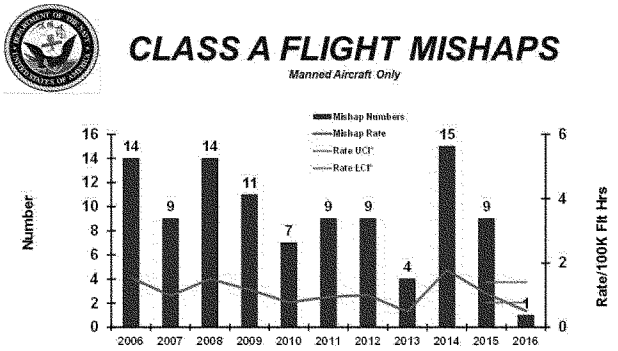
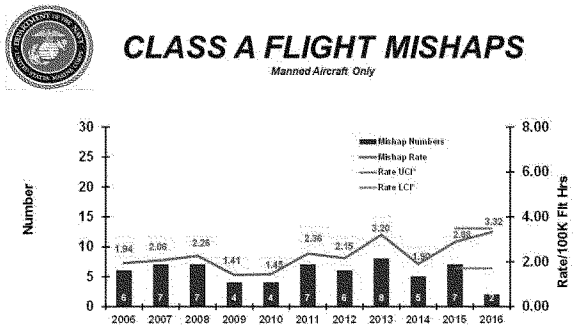


	14-Jan-16	14-Jan-15
CLASS A MISHAPS/MISHAP RATE FY COMPARISON:	1/0.51	2/0.88
FY15 MISHAPS/MISHAP RATE:	9/1.05	
10-YEAR AVERAGE (FY06-15) MISHAPS/MISHAP RATE:	10.10/1.12	

*see last slide for definition of UCI/LCI

Class A Manned Flight Mishap Historical Data for U.S. Navy



	14-Jan-16	14-Jan-15
CLASS A FM/FM RATE FY COMPARISON:	2/3.32	2/3.02
FY15 MISHAPS/MISHAP RATE:	7/2.88	
10-YEAR AVERAGE (FY06-15) MISHAPS/MISHAP RATE:	6.10/2.16	

Class A Manned Flight Mishap Historical Data for U.S. Marine Corps

UCI = Upper Confidence Interval LCI = Lower Confidence Interval
Rate values above the UCI or below the LCI infer a statistically significant change is probable. This is only an indicator. Significance cannot be determined until end-of-year. Values between the UCI and LCI infer that nothing significant has occurred to increase or decrease mishap rate.

Lieutenant General Jon M. Davis
Deputy Commandant for Aviation

Lieutenant General Jon M. Davis assumed his current position as the Deputy Commandant for Aviation, Headquarters Marine Corps in June 2014. Commissioned in May 1980 through the PLC Program, LtGen Davis completed the Basic School in August 1980, and then reported for flight training. Upon receiving his wings in September of 1982, he was selected to fly the AV-8A Harrier.

He reported to VMAT-203 in October 1982, completed Harrier training and reported to VMA-231 in 1983 where he deployed aboard the USS Inchon. In 1985 he transferred to VMAT-203 serving as an instructor pilot. In 1986 he attended the WTI course at MAWTS-1. In 1987 he transferred to VMA-223 serving as the "Bulldogs" WTI and operations officer. From 1988 to 1991 he served as an exchange officer with the Royal Air Force. After training in the United Kingdom, he deployed to Gutersloh, Germany for duty as a GR-5/7 attack pilot with 3(F) squadron. From 1991 to 1994 he served as an instructor at MAWTS-1 in Yuma, AZ. From 1998 to 2000 he commanded VMA-223. During his tour, VMA-223 won the CNO Safety Award and the Sanderson Trophy two years in a row, and exceeded 40,000 hours of mishap free operations. After completing the Executive Helicopter Familiarization Course at HT-18 in Pensacola in 2003, he was assigned to MAWTS-1 where he served as Executive Officer and from 2004 to 2006 as Commanding Officer. From 2006 to 2008 he served as the Deputy Commander Joint Functional Component Command -- Network Warfare at Fort Meade, Maryland. He commanded the 2nd Marine Aircraft Wing from July 2010 to May 2012. From May 2012 to June 2014, he served as the Deputy Commander, United States Cyber Command.

His staff billets include a two year tour as a member of the 31st Commandant's Staff Group, and two years as the Junior Military Assistant to the Deputy Secretary of Defense. In 2003, he served as an Assistant Operations Officer on the 3rd Marine Air Wing staff in Kuwait during Operation Iraqi Freedom. In 2004, he served in Iraq as the Officer in Charge of the 3d Marine Aircraft Red Team. He served as the Deputy Assistant Commandant for Aviation from 2008 to 2010. In the course of his career he has flown over 4,500 mishap free hours in the AV-8, F-5 and FA-18 and as a co-pilot in every type model series tilt-rotor, rotary winged and air refueler aircraft in the USMC inventory.

LtGen Davis graduated with honors from The Basic School and was a Distinguished Graduate of the Marine Corps Command and Staff College. He is a graduate of the Tactical Air Control Party Course, Amphibious Warfare School, Marine Aviation Weapons and Tactics Instructor Course (WTI), The School of Advanced Warfighting (SAW), and Johns Hopkins School of Advanced International Studies (SAIS). He holds a Bachelors of Science from Allegheny College, a Masters of Science from Marine Corps University and a Masters of International Public Policy from Johns Hopkins.

His personal decorations include the National Intelligence Distinguished Service Medal, the Defense Superior Service Medal (two awards), the Legion of Merit (two awards), Meritorious Service Medal (three awards), Navy Commendation (three awards) as well as other campaign and service awards.

Rear Admiral Michael C. Manazir
Director, Air Warfare (OPNAV N98)

Rear Admiral Michael Manazir currently serves as the Director, Air Warfare (OPNAV N98) on the staff of the Chief of Naval Operations (CNO). In this capacity, he is responsible for the development, programming, and budgeting of all U.S. Naval Aviation warfighting requirements, resourcing and manpower.

Manazir entered the U.S. Naval Academy from Mission Viejo, California, and graduated in 1981. He earned his Naval Aviation wings in April 1983, and deployed in the F-14A in July 1984.

Manazir commanded the Tomcatters of Fighter Squadron (VF) 31 (June 97–Sept. 98), USS Sacramento (AOE1) (Jan. 03–July 04), USS Nimitz (CVN 68) (March 07–Aug. 09) and Carrier Strike Group (CSG) 8 embarked on USS Dwight D. Eisenhower (CVN 69) (Sept. 11–June 13).

Prior to squadron command, his afloat tours included service as a fighter pilot and Landing Signal Officer aboard various aircraft carriers on the west coast. Following Navy Nuclear Power Training, Manazir served as the Executive Officer of the USS Carl Vinson (CVN 70) (July 01–Dec. 02). In 2007, Manazir was recognized as the Tailhooker of the Year by the Tailhook Association.

Ashore, Manazir served as an action officer in the Office of the Secretary of Defense, on the Chief of Naval Operations staff as F-14 requirements officer, and for the commander, Naval Air Forces, as the assistant chief of staff for Readiness.

As a flag officer, Manazir served as Director, Strike Aircraft, Weapons and Carrier programs on the Chief of Naval Operations Staff (N880) from Aug. 2009 to Sept. 2011.

Manazir qualified in the F-14A/D and F/A-18E/F aircraft and has flown more than 3750 hours and 1200 arrested landings during 15 deployments aboard aircraft carriers on both coasts.

Manazir is the recipient of various personal and campaign awards including the Legion of Merit (six), the Defense Meritorious Service Medal, the Meritorious Service Medal (two), and the Strike/Flight Air Medal (two). Manazir has been married for 31 years and has two grown children.

Rear Admiral Michael T. Moran
Commander, Naval Air Warfare Center Weapons Division,
Assistant Commander for Test and Evaluation, Naval Air Systems Command

Rear Admiral Michael Moran is a native of New York. He is a 1984 graduate of the United States Naval Academy, where he received a Bachelor of Science degree in Engineering. He was designated a Naval flight officer in 1986. He holds a Master of Science in Human Resources Management from Troy State University and is a graduate of the Air Command and Staff College.

Moran's tours included Patrol Squadron 3 (VP-23) at NAS Brunswick, the P-3C Fleet Replacement Squadron (VP-30) at NAS Jacksonville, Patrol Squadron 16 (VP-16) at NAS Jacksonville and Training Squadron 10 (VT-10) at NAS Pensacola where he served as the executive and commanding officer.

Moran also completed a tour to SDC Dallas as a project officer for an operationally sensitive, high priority Chief Of Naval Operations Program and multiple tours with the Naval Air Systems Command to include; the deputy program manager for Systems Engineering or Class Desk for the P-3 platform in PMA-290, the P-3 Aircraft Improvement Program (AIP) deputy program manager, the P-8A Poseidon deputy program manager where he led the team through several major milestones, and in June 2008 assumed Command of PMA-290 where he was responsible for the test, acquisition, budgeting, and cost-wise readiness programs for the P-8A; P-3C and derivatives; EP-3, S-3 and International Programs to 16 foreign countries. In April 2012 Moran reported to the Undersecretary of Defense for Acquisition, Technology and Logistics USD(AT&L), serving as his military assistant. In August 2013 Moran assumed his current position as the commander, Naval Air Warfare Center Weapons Division and assistant commander for Test and Evaluation, Naval Air Systems Command.

Moran's decorations include the Defense Superior Service Medal, the Legion of Merit, four Meritorious Service Medals, three Navy Commendation Medals, the Navy Achievement Medal, and various other unit awards.

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

FEBRUARY 4, 2016

QUESTIONS SUBMITTED BY MR. JONES

Mr. JONES. I understand that the FY17 PB may not include the $23M in FY17/18 funding for the F–35B Lift Fan facility at FRCE Cherry Point. This funding is critical in order to stand up the facility by 2022. Can you speak to this?

General DAVIS. This MILCON project to support F–35B depot-level work at FRC East Cherry Point is currently in the planning stage, but not funded in the Navy's FY2017 Presidential Budget. This MILCON Project is late to need; it should be complete no later than FY2022 in order to meet F–35 engine test requirements in support of the fleet, but cannot be stood up prior to FY2024 even with funding beginning in FY2018. The Joint Strike Fighter (JSF) Joint Program Office (JPO) planned procurement for the depot support equipment and tooling for the FRC–E is still on track for FOC in CY22.

Mr. JONES. I understand one of the Marine Corps' top priorities would be to move funding left from FY19 to FY17 for a specialized F–35B hangar at Cherry Point. Could you speak to this critical need and if this is one of your top unfunded priorities?

General DAVIS. Based on the planned F–35 squadron laydown schedule for MCAS Cherry Point, funding for a F–35 hangar at this location will be needed in the near future, but not in FY2017. However, we do have a specialized F–35 Hangar aboard MCAS Miramar in San Diego, Ca as one of our top unfunded priorities for this year.

Mr. JONES. Sir, I understand that the Marine Corps desires to have a security fence constructed at MCAS, Cherry Point. Where does this fall on the Marine Corps unfunded priorities list? And in what fiscal year will it be funded?

General DAVIS. The MCAS Cherry Point airfield security fence was funded in the FY2016 MILCON budget. We appreciate Congress adding this project to the program.

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